Passed March 1828

An
Inaugural Essay
On
Pertussis,
For
The degree of M. D.
In
The University of Pensylvania:
By
William M. Fenimore
Of
New Jersey.

Jany 5th 1828.

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pertussis, or whooping cough, which I have selected for the subject of this dissertation, is a disease, which is, almost exclusively, confined to the ages of infancy, and childhood; and, which, having once run its course, commonly, exonerates the system, from the liability to a second attack: Yet, numerous instances are recorded, as well, of its having attacked persons at an advanced period of life, as, of its having occurred repeatedly in the same individual.

An attack of this disease is, usually, ushered in with the ordinary symptoms of catarrh; — there is a sense of lassitude, & weakness, with pain in the head; some degree of hoarseness; dry cough; frequent sneezing, with a discharge of thin mucus from the nostrils; loss of appetite, and, commonly, more or less febrile excitement: — These symptoms, frequently, continue for many days, before the disease appears in its usual form; And, it has, even, been said by Cullen, that, "he has known instances of a disease, which, though evidently arising from the chin-cough contagion, never put on any other form, than that of common catarrh." But this does not often happen, and, more generally,

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in the course of two or three weeks, the disease takes on its characteristic symptoms; particularly, the paroxysms of convulsive coughing.

A paroxysm consists in a number of short convulsive expirations, following each other in rapid succession; and, which are sometimes continued, untill the patient becomes nearly exhausted, and is, apparently, on the point of suffocation; when the lungs are filled, by a violent inspiration, which is attended by that peculiar noise, called, a whoop; (from whence, the disease has recieved the popular appellation of Whooping-cough.) — the convulsive expirations are now renewed, and, again, terminated in the same manner, by the sonorous inspiration; and, in this way, the paroxysm continues, untill, there is a discharge of phlegm or mucus, from the lungs, or, untill the contents of the stomach are ejected by vomiting; after which, with the exception, of some degree of temporary exhaustion, and uneasiness of the chest, the child, in common, remains cheerfue and lively, and, apparently, free from disease, untill the coming on of the next paroxysm, when, are again presented the same phenomena as above described.

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After the termination of the paroxysm, the patient has, commonly, a strong desire for food, and, more especially, if the stomach has been evacuated by vomiting.

During a paroxysm, the blood, from its interrupted circulation thro' the lungs, is, sometimes, forced to the head with such violence, that, hemorrhages from the nose, ears &c. not unfrequently take place; the lips and eyelids swell; the eyes appear ready to start from their sockets; the countenance becomes of a livid hue; and there are all the symptoms of immediate strangulation:

A sense of dizziness, also, arises from the same cause, and the sufferer, from a consciousness of this, at the commencement of a paroxysm, clings to the nearest object for support, or throws himself on his hands and knees, and in this position remains untill its violence has abated. — At other times, the effects of the fit are much milder, and during its continuation, the child experiences little inconvenience. —

The fits of coughing occur with various degrees of frequency; sometimes, in mild cases, not happening, oftener, than five or six times, in the course of twenty four hours; while, in more vio-

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-lent attacks, they may occur every half hour; especially during the night, when, they are always more frequent, as well as, more severe.

Pertupis, being once confirmed, frequently continues, if left to itself, for three or four months; and sometime, tho' rarely for over ten or twelve months; but, when judiciously treated, its course may be considerably abbreviated: Much, however, will depend on the season of the year in which it occurs, both as relates to its duration, and the severity of its symptoms; an attack being always more violent, and its course more protracted during winter.

As to the origin of pertupis, there is not a little difference of opinion: many firmly believing in its contagious nature, while others, entirely, deny its propagation in that manner, and ascribe its production altogether to atmospherical influence; and, from its frequent prevalence as an epidemic, together, with the knowledge of its having, occasionally, broken out in situations where there had been no intercourse with an infected source, the advocates of its non-contagious nature appear to be entitled

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Nor, is there less diversity of sentiment among those who have written on this disease, with respect to their pathological views, disagreeing, as well, in the organs in which they consider the disease to be primarily located, as, in the nature of its proximate cause. The opinion has been advanced by some, that the brain was the original seat of the disorder: while others have located it in the alimentary canal; the lungs being said to participate in the disease, merely, from sympathy: Some have declared it to be, entirely, of a spasmodic nature, while others have described its phenomena, as being, exclusively, the effects of inflammation. But, the notion, which at present is pretty generally entertained, and which appears the most rational, is, that pertupis is a primary affection of the organs of respiration: any other organs or tissues that may become involved during the course of the disease, do so, either from sympathetical influence, or from the effects of mechanical obstructions during the paroxysm. — The remote cause, whatever may be its nature, is applied to the mucous membrane,

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which line the trachea and bronchiæ; exciting a greater or less degree of irritation, strongly tending to, and, frequently, running into inflammation; as a consequence of this condition of the secreting membrane, the fluids become vitiated, and increased in quantity; and, for their expulsion, when unduly accumulated, the paroxysms of coughing, as above described, are called into action. Fits of coughing may likewise be excited by various causes, as, the irritation of acrid matters inhaled with the breath, violent exercise, laughter &c. Concerning the diagnosis, not much need be said. The peculiar character of the cough, connected with the more gradual manner, in which an attack of pertussis makes its approach, will be found sufficient, to distinguish it from other affections of the respiratory organs; as spasmodic asthma, bronchitis, cynanche trachealis &c. There is, however, a disease, to which pertussis, in its first stage, bears so strong a resemblance, that, frequently, if we confine our attention entirely to the existing symptoms, it will be found no easy matter, to distinguish the one from the other. — I allude to an attack of common catarrh

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from cold. There is, however, in the latter, commonly, more febrile excitement, and the patient is less disposed to coma than in whooping-cough: But, the most certain diagnosis will consist, in our knowledge of the prevailing disease: — for, if a child be attacked with catarrhal symptoms, during the prevalence of whooping-cough as an epidemic, it will, generally, be found, that these, are, merely, the forerunners of other symptoms, of a character so peculiar, as to leave no doubts on the subject. And, under these circumstances, we will, most commonly, be correct, in deciding the disease to be an attack of the prevailing epidemic; and, should we ever be wrong in our judgement, little importance need be attached to the mistake, as, at this period, the treatment to be pursued, is precisely similar in either case. —

To prognosticate with any degree of certainty, how an attack of this disease will terminate, it will be necessary to take into consideration, the period of life at which it takes place; the violence of the attack, and the state of the patient's constitution.

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As to the time of life, at which, an attack takes place, Dr. Cullen says, "the younger that children are, they are in the "greatest danger from this disease; and of those to whom "it proves fatal, there are many more under two years of "age, than above it: and the older children are, they are "the more secure against an unhappy event; and this I "hold to be a very general rule, though, I own, there are ma-"ny exceptions to it."— But, on the other hand, it is affirmed by Dr. Gregory, that, "the danger is not proportioned to the "age of the child, for, one, of two or three months old, will "struggle through the disease, as well as, another, of two "or three years." This latter opinion is, perhaps, not founded on accurate observation, as, it is generally found that a very tender age is unfavourable, principally, from the inability of infants to obtain relief by expectoration and consequently, unless the mucus is expelled from the lungs by the action of vomiting, they are, sometimes, in danger of being suffocated by it; and, hence arises the greater utility of emetics, in their management.

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The principal symptoms that denote a severe, and danger-ous disease, are much febrile excitement, great difficulty of breathing, and violent, and frequent paroxysms of cough-ing, attended with scanty expectoration: copious expec-toration in very young infants is likewise unfavourable: Copious hemorrhages from the nose, are generally, injurious, from the debility they occasion: The supervention of an attack of pleurisy, or other inflammatory disease, is, also, inauspicious, and, frequently, fatal.

The state of the patients constitution is, likewise, to be taken into consideration, in forming a prognosis. It will be unfavourable, if the attack occur in those, who have been debilitated by some previous disease, as cholera-infantum, diarrhœa &c.

The irritation, produced by dentition, will, likewise, have an unfavourable effect on the disease.

Children who inherit from their parents, predispositions to pulmonary affections, as phthisis pulmonalis, asthma, &c. are very obnoxious to a fatal termination, and, are,

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indeed, seldom known to recover. But, when pertussis occurs to children of sound constitutions, — when no inflammatory affection supervene, — when the paroxysms are neither frequent, nor violent, and terminate in free expectoration, or vomiting, — and, when the patient, during the intermission, has a desire for food, a disposition to sleep, and, is, neither, troubled with fever, nor difficulty of breathing, the case may, commonly, be considered, as without danger, and, we will be justifiable in delivering a favourable prognosis.

Pertussis, when fatal, may terminate in various ways. — Life may be, instantaneously, destroyed, during the paroxysm, by suffocation; or, the patient may be carried off by convulsions, brought on by the violent shock recieved by the system; Or, the free transmission of blood through the lungs, being interrupted, the consequent increased determination to the vessels of the brain, may produce an attack of apoplexy, immediately destructive of life.

Foundations may be laid for other diseases, which may

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prove, ultimately, fatal, though in a much more gradual manner: thus, from the extension of inflammation to the pleura, serous effusions may be produced, constituting hydro-thorax; or, the tunica-arachnoidea may take on inflammatory action, coentuating in hydrocephalus internus: Ascites, likewise, is said, sometimes, to follow an attack of pertupis. — Phthisis pulmonalis is not an unfrequent occurrence, especially, in those, who are predisposed to it. — But, perhaps, the most common manner, in which, an attack of pertupis proves fatal to life, is, by gradually wearing out the strength of the patient, by marasmus, or hectic fever. —

Treatment. It is very probable, that in the whole catalogue of diseases to which the human race is subject, there is not one of equal severity, that, in general, is subjected to more empirical modes of treatment, than whooping-cough; Nor, perhaps, is there one, in which, more benefit may, occasionally, be derived, from the employment of appropriate remedies.

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excitement, or dyspnœa, and, in which the disease appears to consist, chiefly, in the paroxysm of coughing, little medical assistance, indeed, is requisite. Costiveness should be obviated, by the occasional use of castor oil, or rhubarb. — Small doses of Antimonial wine, or, what is better perhaps, the Comp. Syrup. of Squills, may, also, be employed, to facilitate expectoration, occasionally, (especially in very young infants,) increasing the dose, in order to produce vomiting: Antispasmodics, as Assafœtida, or, the tincture of Musk, are useful, to allay the cough; and, sometimes, will speedily arrest the progress of the disease. These means, together with attention to diet, and taking care to guard against the effects of cold, in order to prevent the lighting up of inflammation, will, commonly, be all-sufficient.

But, should the attack, from the commencement, be of a more violent character, or, should it become so during its progress, it will be highly necessary for the welfare of the patient, that a greater share of attention should be paid to the disease, and its violence combatted by

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In treating the disease, under these circumstances, the first indication evidently is to moderate the violence of the disease, and palliate the urgent symptoms: And, for this purpose, the evacuating remedies are undoubtedly to be employed.

In all severe cases, attended with much febrile excitement, with a full hard pulse, and great difficulty of breathing, or, if there be symptoms of pneumonic inflammation, general blood-letting is indispensible, particularly, in those of full plethoric habits: — the quantity to be drawn is to be proportioned to the age of the patient, and the severity of the symptoms; and, should relief not be obtained by the first bleeding, the operation should be repeated.

Much benefit will also be derived, by detracting blood locally from the chest, by means of cups, or leeches; and, in many cases, when the symptoms are less violent, or, when the patient is of a very tender age, general bleeding may be entirely dispensed with, and, topical depletion alone, confided in.

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be derived from their use may be inferred, from what is said in relation to them, by Dr Chapman, in his treatise on Materia-Medica and Therapeutics.

"Of the various remedies, "says he", that at different periods "have been suggested for the cure of pertussis, I know of no "single one from which I have derived better effects, than from "emetics; In the earlier stages of the complaint they are chiefly "applicable, and when the attack is violent, they must be re-"peated daily, or even twice a day, for a week or two in suc-"cession: By steadily persevering in this course, and with the "auxiliary means proper to the case, we shall generally be "able to conduct the case to a comparatively speedy and suc-"cessful issue, provided it be that of a child, as the remedy is "not so well adapted to persons in more advanced life."

Of this class of remedies, the tartarized antimony is generally employed, being preferred, as well, on account of its superior efficacy, as from the greater facility with which it may be administered to children, than most other articles of the class. It may be given, either, in the form of Antimonial wine,

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or in that of watery solution. Of the wine, a child within the year may take ten, fifteen, or twenty drops, or more, according to circumstances, at short intervals, untile vomiting is excited. The watery solution may be prescribed in the proportion of 3 grains of the Antimony, to 6 ounces of water, with a little syrup. — Of this, a large teaspoonfull may be given, every fifteen minutes, to a child of one or two years old, untile it take effect. —

The comp. syrup. of Squills, or, as it is more commonly called, the "Wine Syrup" is also an invaluable article. — to produce vomiting, the dose should be large and frequently repeated.

Ipecacuanha, Sulphate of zinc, and other articles, may likewise be substituted for the tartarized antimony.

Purgative medicines are also demanded, on account of the costive condition of the bowels which commonly attends the disease: They are also serviceable, by relieving those determinations to the head which so frequently exist.

The bowels should be evacuated, every two, or three days, by the administration of a mercurial purge. A child of a year old

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may take 2 or 3 grains of calomel, in combination with a small portion of jalap or rhubarb; and, if the bowels be not sufficiently opened by this, the operation may be assisted by a little castor oil. — Rhubarb alone, or an infusion of senna, may also be employed with advantage, to keep the bowels in a soluble condition. —

After bleeding, and other evacuating remedies, if the difficulty of breathing, and sense of oppression, still remain unsubdued, the application of a blister to the chest will be attended with decided advantage.

Expectorant medicines of various kinds are sometimes of great benefit: as ipecacuanha, antimonial wine, syrup of squills &c. in small doses, frequently repeated. —

The expulsion of the viscid phlegm will also be facilitated, by the inhalation of various vapours; as, of warm water & vinegar, or æther &c. — The tar vapour is also useful. —

After the violence of the disease has been moderated, and the inflammatory symptoms have been subdued, by the various remedies employed for that purpose, articles of an

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entirely different character are to be resorted to, with a view of arresting the progress of the disease.
The fixed alkalies are much employed. They are prescribed in doses of 2 or 3 grains, with a few drops of wine of Ipecacuanha and one drop of Laudanum, two or three times a day to a child of a year old.
Nearly all the articles of the class of Narcotics, are likewise prescribed, at different times, and after the reduction of the more violent symptoms, they may be useful by allaying the morbid sensibility of the affected parts, and thereby putting a stop to the disease. Of these, perhaps, Opium will be found, in common, the most useful: The best mode of prescribing it is in watery solution. Digitalis is said by Dr Peirson, in his treatise on chincough, to be of most decided efficacy; his mode of prescribing it is in the form of saturated tincture, of which, he says a child of a year old may safely take 6 drops, at intervals of six hours; the dose to be increased, one drop every day, untill a diuretic effect is produced, or untill

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its effect on the pulse, demands its suspension.
Hemlock, Prussic acid, Belladonna, Stramonium &c are all frequently administered with the same view, and not without occasional benefit.
Advantage is likewise to be obtained from the employment of Antispasmodics, as Assafoetida, Musk &c.
Sometime, the disease appears to be prolonged merely by the force of habit, and in this case, to break up the train of morbid associations, and restore the healthy functions of the system, the peruvian bark and other tonics appear to be peculiarly appropriate; but particular care should be taken that these articles be not employed, while there is the slightest evidence of inflammation, or their administration will be decidedly injurious.
Not a small proportion of praise is conferred on the internal use of cantharides, at this period of the disease. It is commonly prescribed in tincture, with a little laudanum; commencing with small doses

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and gradually increasing them untill strangury is induced; on the occurrence of which, the progress of the disease is frequently arrested.

Stimulating articles, as spirits of turpentine, tincture of cantharides, juice of garlic, &c rubbed along the spine, and applied to the soles of the feet, sometime have a good effect.

A change of residence will sometimes perform a cure, after all other means have failed.

Strict attention to diet is highly necessary throughout the whole course of the disease, and the success of the treatment will depend in a great measure, on the degree of exactness with which the directions in this respect are performed: it should consist of light and unirritating articles in the first stage, but, after the force of the attack is spent, those of a more nutritive character are to be employed.

Convulsions sometime occur during the paroxysms; they are to be relieved by the use of the warm bath, the

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application of leeches to the temples, purging &c. —
Hydrothorax, hydrocephalus, marasmus, and the various sequelæ of the disease, require peculiar forms of treatment, of which nothing is to be said here, as the subject is of a nature, unconnected with this discussion.